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TIME-DOMAIN TERAHERTZ SPECTRSOCOPY OF POLYCYCLIC AROMATIC HYDROCARBONS

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Polycyclic aromatic hydrocarbons (PAHs) present themselves as a strong candidate as carriers of the unidentified infrared features (UIRs). As UIR carriers, PAHs may account for up to 20% of the interstellar carbon budget and may play key roles in many chemical and physical processes in the ISM, and yet our inability to definitively detect PAHs hinders our ability to evaluate the role they may play. A possible solution is observations in the TeraHertz (THz) regime, where observed transitions are specific to each molecule. Recent advances in THz technology have enabled both laboratory spectroscopy and astronomical observations in this region. A first step in both laboratory and astronomical studies of PAHs is the acquisition of spectra of pure PAH samples. Here, we present the THz time-domain spectra (0.3 - 7 THz) of several PAHs, including naphthalene, anthracene, and pyrene, and discuss the utility of these spectra for future laboratory and astronomical studies.